



# INDRAPRASTHA GAS LIMITED

(A Joint Venture of GAIL (India) Ltd., BPCL & Govt. of NCT of Delhi)

Date: 04.07.2022

## PRE - TENDER MEETING FOR CONDUCTING QUANTITATIVE RISK ASSESSMENT (QRA) AND HAZARD AND OPERABILITY ANALYSIS (HAZOP)".

Indraprastha Gas Limited (A joint venture of Gail India Ltd., BPCL & Govt. of NCT of Delhi) is a pioneer & Leading Company which is providing CNG to automotive sector and PNG to domestic, commercial & industrial sector.

Indraprastha Gas Limited is a PNGRB authorized entity for retailing of CNG & PNG in Delhi, Noida, Greater Noida, Hapur, Ghaziabad, Meerut, Muzaffar Nagar, Shamli, Rewari, Karnal, Kaithal, Gurugram, Ajmer, Pali, Rajsamand, Fatehpur, Hamirpur and part of Kanpur accordingly IGL invites pre tender meeting of reputed agencies for conducting Quantitative Risk Assessment (QRA) and Hazard and Operability Analysis (HAZOP)".

IGL intend to have discussion & deliberation on technical and commercial aspects for conducting Quantitative Risk Assessment (QRA) and Hazard and Operability Analysis (HAZOP)"and getting inputs from potential bidders for a successful competitive bidding.

The meeting shall be conducted through video conferencing online at Microsoft teams (MS Teams) platform. **Instructions to bidders for meeting through video conferencing:**

- (i) All the Bidders who have interest to attend the pre tender meeting will send the email up 2 hours prior to start of scheduled meeting will be invited to join as guests through the link shared in mail.
- (ii) Upon joining the video conference, bidders have to mention their organization name as well as representative name.
- (iii) All bidders/participants mandatorily have to pin IGL screen on their computer screens during the meeting.
- (iv) Bidders shall be allowed to discuss their queries in sequence of their responses received.
- (v) Time slot shall be allotted to each bidder to ask his /her queries.
- (vi) Recording shall be done for the meeting.
- (vii) Clarifications or queries raised shall be responded to during meeting or through subsequent email.

IGL Bhawan, Plot No. 4, Community Centre, R.K. Puram, Sector - 9, New Delhi-110 022  
Phone : 46074607 Fax : 26171863 Website : www.iglonline.net

CIN : L23201DL1998PLC097614

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DHEERAJ  
TILWARI

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S.No.	Description	Schedule of Meeting
1	Pre tender Meeting for conducting Quantitative Risk Assessment (QRA) and Hazard and Operability Analysis (HAZOP)".	<b>Monday 15:00 PM to 16:00 PM on 11<sup>th</sup> July 2022.</b>

All potential bidders are requested to kindly confirm your participation at following email ids

1. [u.bhandari@igl.co.in](mailto:u.bhandari@igl.co.in)
2. [ckmishra@igl.co.in](mailto:ckmishra@igl.co.in)
3. [adhar@igl.co.in](mailto:adhar@igl.co.in)
4. [ajay.khatri@igl.co.in](mailto:ajay.khatri@igl.co.in)
5. [dheeraj.tiwari@igl.co.in](mailto:dheeraj.tiwari@igl.co.in)
6. [prashant.agarwal@igl.co.in](mailto:prashant.agarwal@igl.co.in)
7. [nisha.bhinge@igl.co.in](mailto:nisha.bhinge@igl.co.in)

**Thanks & Regards**

**For & On Behalf of INDRAPRASTHA GAS LIMITED**

*Ujwal Bhandari*  
4.7.22

**Ujwal Bhandari**  
**HOD (Fire & Safety)**

**Enclosure: Brief Scope of Work**

*Dheeraj Tiwari*  
**DHEERAJ TIWARI**  
**CHIEF MANAGER**

# INDRAPRASTHA GAS LIMITED

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**1. INTRODUCTION:** INDRAPRASTHA GAS LTD (IGL) is a city gas distribution company engaged in the business of PNG distribution to Industrial, Commercial, Domestic Customers and CNG to automobile sector in various geographical areas of NCT of Delhi, Uttar Pradesh, Haryana and Rajasthan state(s).

This document covers the requirements for carrying out various safety studies like Hazard & Operability analysis (HAZOP); Quantitative Risk Assessment (ORA); of existing/proposed Pipeline network, CGS (City Gate Stations), PRI (Pressure regulating installations/skids), CNG stations, LNG/LCNG Facilities and related equipment, facilities of Indraprastha Gas Limited in following geographical areas:

- i) NCT of Delhi and NCR (Ghaziabad, Gurugram, Gautam Buddha Nagar, Dadri, Hapur),
- ii) Rewari (Haryana)
- iii) Karnal (Haryana),
- iv) Kaithal(Haryana),
- v) Ajmer Pali & Rajsamand (Rajasthan),
- vi) Meerut (except area already authorised), Muzaffarnagar and Shamli (Uttar Pradesh),
- vii) Kanpur (except area already authorised), Hamirpur and Fatehpur (Uttar Pradesh),.

The geographical area wise quantity envisaged is as given in table 1.0 below:

Sr.No.	Particular	UOM	UTTAR PRADESH GA-1				UTTAR PRADESH GA-2				UTTAR PRADESH- PART OF NCR GA		Rajasthan			HARYANA				GRAND Total Quantity [A+B+C+D+E]			
			Muzaffarnagar,	Shamli	Meerut	Total [A]	Kanpur	Fatehpur	Hamirpur	Total [B]	Dadri	Hapur	Total [C]	Rajasthan			HARYANA						
														Ajmer	Pali	Rajsamand	Total [D]	Kaithal	Karnal		Rewari	Gurugram	Total [E]
1	HAZOP Study	EA	13	4	0	17	7	2	0	9	1	1	2	9	6	0	15	4	15	16	9	44	87
2	QRA Natural Gas Pipeline (up to 10 km)	EA	3	3	1	7	4	1	1	6			0	2	2	0	4	1	4	6	5	16	33
3	QRA Natural Gas Pipeline (10-30 km)	EA	0	1	0	1	0	1	2	3			0	2	2	0	4	3		1		4	12
4	QRA Natural Gas Pipeline (30-60 km)	EA	3	0	0	3	0	1	1	2			0	1	0	0	1		2	1		3	9
5	QRA Natural Gas Pipeline (60-100 km)	EA	0	0	0	0	0	0	0	0			0	0	1	0	1					0	1
6	QRA Pipeline connecting to IGL owned CNG Station covering all CNG facilities	EA	2	1	0	3	0	0	0	0			0				0		2			2	5
7	QRA Pipeline connecting to CNG facility in OMC having liquid fuels	EA	2	1	0	3	0	0	0	0			0				0		1			1	4
8	QRA Any other Facility having pipeline connectivity to CGS, FRS/DRS/ decompression skid etc. and covering their overall facilities.	EA	2	1	1	4	1	0	0	1			0	6	6	0	12		1	9	4	14	31
9	QRA Any other case of pipeline relevant for QRA	EA	1	0	0	1	0	0	0	0	1	1	2				0					0	3
<b>Grand Total</b>			26	11	2	39	12	5	4	21	2	2	4	20	17	0	37	8	25	33	18	84	185

**2. SCOPE OF WORK:** The scope/specification covers the minimum specified requirement for the various activities to be carried out by the Contractor/Agency toward the safety study related work as mentioned in contract.

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*(Signature)*  
DHEERAJ TIWARI  
CHIEF MANAGER

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**2.1 SPECIFICATION OF WORK:** Contractor/Agency shall, with due care & diligence, execute the work in compliance with all laws, by laws, ordinances, regulation etc. Contractor/Agency shall follow the latest edition/amendments of all applicable laws, guidelines, ordinances, regulations etc. issued by the concern authority time to time.

Contractor/Agency shall carry out safety study with compliance to latest versions of below listed regulations / codes/standards; but not limited to Laws, codes, rules and standards as mandatory under the legislation of India and respective state government

- PNGRB regulations applicable to City Gas Distribution:
  - Technical & Safety Standards,
  - Integrity Management System,
  - Emergency response & Disaster Management Plan)
- IS 15656 : 2006 Hazard identification and risk analysis - Code of practice
- NFPA 52
- ISO 16923 -2016
- OISD 226 (Part-II)
- OISD 179 and any other applicable OISD standard.
- API RP 500-Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class 1, Division 1 and Division 2, Second Edition, Nov 1997.
- BS IEC 61882:2001 Hazard and Operability Studies (HAZOP Studies)-Application guide.
- Guidelines for Quantitative risk assessment (QRA) - 'Purple Book, CPR 18E
- IS: 5572:2009 Classification of hazardous areas (other Than mines) having flammable gases and Vapours for electrical installation, Third Revision reaffirmed in 2018.
- Risk assessment data directory – Evacuation, escape & rescue by International association of Oil and Gas Producers (IOGP) Report No. 434-19 published year 2010
- Risk assessment data directory – Ignition probabilities by International association of Oil and Gas Producers (IOGP) Report 434-06 published year 2010

**2.2** A typical report format describing methodology, compliance of applicable standards shall be prepared by Contractor/Agency and same approved by engineer incharge of IGL and/or its representative before execution of Job. The quality of the report shall be decided and approved jointly by engineer incharge of IGL.

**2.3** Contractor/Agency shall address all the inputs/comments/suggestion provided by engineer incharge of IGL on the report.

**2.4 LOGISTIC SUPPORT, ACCOMMODATION AND TRANSPORTATION:** All the logistic support, travelling/ transport including the local conveyance, boarding and lodging will be in the scope of contractor i.e. Travel, Transportation, Stay, equipment, appliances, communication facilities to the team member i.e. Mobile telephone, computers/laptop including the relevant softwares and standards required for the purpose of aforementioned Risk Assessment work or other things /jobs of whatsoever nature required in or about the execution of the work, whether of temporary or permanent nature shall be in the scope of Contractor/Agency with no extra cost to IGL. Without limiting the generality thereon, Contractor/Agency shall do all work necessary at each of the activity which is required to complete job in all respect.

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The WORK site would be on case to case basis across IGL's aforementioned (Sr. No.1.0) geographical areas, but no additional transportation charges/miscellaneous charges would be paid.

- 2.5 Contractor/Agency shall not allot sub-contract for any or part of the awarded work/purchase order to any other party /contractor/agency as the contract is non-transferrable and non-assignable.
- 2.6 All the responsibility for the completion of job will be in the Contractor/Agency's scope.
- 2.7 If the work is not executed as per the satisfaction of IGL then Contractor/Agency shall do the necessary rework at its own cost i.e. No additional cost will be paid for the rework/re-study. Failing upon which IGL shall reserve the right to complete the work at his own and the actual cost incurred to execute such work shall be collected/recovered from Contractor/Agency.

## 2.8 CONFIDENTIALITY :

- 2.8.1 The Contractor/Agency shall not communicate or use in advertising, publicity, or use in any other medium, photographs or other reproduction of the work under this contract or description of the site dimensions, quantity, quality or other information, concerning the work and name of the company unless prior written permission has been obtained from IGL.
- 2.8.2 During carrying out Risk Assessment site/installations details, data, information if any obtained or gained from the IGL during the contract, shall be kept strictly confidential and shall not be in any case shared, disclosed or used anywhere or to anyone. Any breach found of such shall lead to Contract/Service provider compensating to IGL for all the damages and may also in lead to termination of this contract and blacklisting for any future contracts with IGL.
- 2.8.3 The Contractor/Agency shall need to sign a Non-Disclosure Agreement (NDA) with IGL i.e. Indraprastha Gas Limited in this regard.

## 2.9 TECHNICAL REQUIREMENTS:

- 2.9.1 **TRAINING & AWARENESS:** Contractor/Agency shall conduct training/awareness session on relevant study (QRA, HAZOP, EERA, and HAC.) to make IGL team aware about the process, methodology assumptions, and exclusions before starting of the safety study (HAZOP /QRA) session with IGL representatives. No additional cost shall be paid to Contractor/Agency for such training program. The place (venue) for training and number of participants (maximum 25 persons) will be provided to the service provider/contractor by the IGL.
- 2.9.2 **HAZOP ( HAZARD AND OPERABILITY ANALYSIS) STUDY:** Minimum requirements to be followed for carrying out the Hazard and Operability analysis study of IGL's installations are including but not limited to:

### 2.9.2.1 Data collection & Planning:

- a) Once the work/purchase order is awarded, the Contractor/Agency need to timely coordinate with IGL to fetch /get following details for HAZOP which may include:
- Site visits;
  - Process description and parameters
  - Process & Instrumentation Diagram.
  - Materials of construction.
  - Physical properties and hazardous data sheets for chemicals (MSDS).

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- Layout (if applicable)
  - Any other as required
- b) Planning the HAZOP session along with IGL's multi-disciplinary team. IGL will select its team for the HAZOP study session.
  - c) Contractor/Agency shall dedicate at least 8 hours for HAZOP session of complex P&ID for CGS, CNG Stations, LNG/LCNG Stations, major equipment like compressor, Decompression skid, Odourisation Skid, SV Stations etc.
  - d) Contractor/Agency shall dedicate at least 4 hours for HAZOP session of simpler P&IDs for e.g. CNG Cascade, Dispenser, CNG/LNG Transportation Trucks, and Priority Panel etc.
  - e) Should the need arise to differentiate between the simple and complex P&IDs IGL's decision shall be treated final in this regard.
  - f) HAZOP sessions will be carried out through in person meeting at IGL's identified place. The intimation regarding such place /venue will be given to Contractor/Agency by IGL on receipt of the request from Contractor/Agency.
  - g) IGL reserves the right to carry out HAZOP sessions virtually /remotely through Video Conferencing through MS Teams/Zoom /WEBEX /Google meet etc.in the event of any exigency e.g. COVID 19 outbreak or other unforeseeable circumstances.
- 2.9.2.2** Identifying nodes considering various operating/design parameters
- 2.9.2.3** Applying Parameters; Guidewords; Determine Deviation; Identify all potential causes of the deviation; Appraise the Consequences of the deviation qualitative evaluation or estimation of the severity of the consequences using Risk assessment matrix; Appraise the Safeguards preventing or mitigating the deviation and its consequences: Providing Recommendation with justification.
- 2.9.2.4** Once all causes and consequences for a given deviation have been identified and the requirement for action discussed, the process iterates until all Guidewords have been combined with a selected parameter; Once that all guidewords have been considered the next parameter will be selected and the process will be repeated until all parameters have been applied; and the discussion moves to the next node and the process will be repeated until all nodes are applied.
- 2.9.2.5** Referring IEC 61882 Hazard and Operability (HAZOP Studies)-Application Guide Documenting all the discussions systematically.
- 2.9.2.6** Contractor/Agency shall obtain prior approval of IGL in case he needs any timeline extension in any assignment communicated to him by IGL. IGL shall be the final authority to grant timeline extension if justified.
- 2.9.3** QUANTITATIVE RISK ASSESSMENT(QRA) STUDY: Minimum requirements to be followed for carrying out the QRA of IGL's installations are including but not limited to:
- 2.9.3.1** **Data collection & Planning:** Once the work/purchase order is awarded, the Contractor/Agency need to timely coordinate with IGL to fetch /get following details for QRA which may include:
- a) Process description and parameters.
  - b) General Plant layout drawing or layout drawings of the facility.
  - c) Piping lengths and sizes for estimation of failure frequencies as required for identified scenarios/risk analysis.

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- d) As built route drawing or alignment sheets (In case of pipeline ORA).
- e) Updated P&IDs.
- f) Composition of fluid handled in the pipeline/facility
- g) Site visits shall be carried out for all the installations/locations to collect & verify the correctness of the information/data.
- h) Population & Environmental data of the surrounding areas shall be collected by the Contractor/Agency.
- i) The weather data needs to be taken from the state meteorological department considering the Wind Rose diagram - with 24 directions and selection of stability of winds needs to be selected with written logic

**2.9.3.2 SITE VISIT:** CONTRACTOR/AGENCY shall ensure data collection through a thorough site visit and validation of source of data during site visit itself.

**2.9.3.3 SOFTWARE:** Contractor/Agency shall ensure that relevant Risk Assessment jobs are carried out using latest and authentic version (8.22 & higher) of DNV PHAST & SAFETI software. Software license shall always remain valid during the contract period with IGL. Valid License copy in the name of CONTRACTOR/AGENCY of the software shall be submitted to IGL for the latest version (8.22 & higher) of PHAST & SAFETI software before the start of the QRA.

**Note:** As on date there is no software recommended by either PNGRB or MOEF Government of India, in future if there are any such recommendations, the Contractor/Agency shall comply with the said requirements

**2.9.3.4 RISK ACCEPTANCE CRITERIA:** As per PNGRB GSR 39 (E) ERDMP regulations, risk acceptance criteria of HSE, UK shall be referred for the purpose of the QRA study,

**2.9.3.5 QRA study shall comprise including but not limited to following minimum steps/ activities:**

- System Description
- Hazard Identification
- Failure case listing
- Release Consequence Estimation based on Maximum Credible Accidents MCA. Scenario
- Consequence analysis
- Recommendation for Risk Reduction (keeping in mind that risk mitigation/reduction measures proposed shall be practical and realistic from implementation point of view).

**2.9.3.6** The Contractor/Agency shall use all the latest approved OGP international data base for failures or probabilities as instructed by IGL and should mention the details/references in the report.

**2.9.3.7** Estimation of the frequency of key events occurring and development of scenario logic event tree) for all possible outcomes arising from each top event. Also estimate the probability of each outcome on event trees.

**2.9.3.8** The Contractor/Agency shall identify and indicate failure modes, its effects and carry out criticality analysis for most probable and worst-case scenario events.

**2.9.3.9** The Contractor/Agency shall also indicate causes arising out of each event as Fault tree analysis.

**2.9.3.10** Calculate the quantity of material that may be released in each failure, estimate the probability of such occurrences.

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- 2.9.3.11 Evaluate the consequences of such occurrences based on scenarios such as most probable and worst case scenario events.
- 2.9.3.12 The consequence modelling approach and the specific models used by Contractor/Agency shall be clearly described within the QRA report. Each stage of the consequence modelling (e.g. discharge dispersion, toxic effects, fire or explosion, etc.) shall be clearly reported, including discussion of the results. Contractor/Agency shall publish the results derived from dispersion and consequence modelling in tabular as well as graphical form.
- 2.9.3.13 The Contractor/Agency shall clearly identify the high risk portions of the pipelines network, CGS, CNG stations, PRI (DRS/FRS/MRS etc.) and related facilities and show with colors the different damage distances & contours on the actual route diagrams of the pipeline/ or plot plan of the facility
- 2.9.3.14 Assessing individual Risk, location specific individual risk and make graphical representation by contouring it.
- 2.9.3.15 Carry out impact analysis to estimate potential loss of life, equipment, revenue, environment) from each outcome.
- 2.9.3.16 Integration of the likelihood and consequence to obtain the total risk.
- 2.9.3.17 Development of the risk assessment criteria based on applicable PNGRB GSR 39 (E) ERDMP regulation requirement.
- 2.9.3.18 Assessment of the risk (comparison of different options, comparison against tolerability criteria or against historical achievement, etc.)
- 2.9.3.19 Contractor/Agency shall ensure QRA results are presented to clearly show the most significant contributors to total risk to assist in the identification of potential risk reduction measures
- 2.9.3.20 The estimated risk needs to be graphed on the ALARP bands as per PNGRB criteria clearly showing the Intolerable, ALARP or tolerable and Broadly Acceptable bands
- 2.9.3.21 Recommend appropriate actions to meet ALARP if the risk levels are unacceptable. Identifying risk reduction measures and assessing the effectiveness of such measures. Every recommendation and measures proposed shall be provided with;
- Detailed standard references/recommended engineering practices in which it is referring to:
  - Risk reduction value demonstration if recommendation is implemented
  - Commercial viability
  - All supporting methodologies, calculations, design as applicable
- 2.9.3.22 Document all the models systematically
- 2.9.3.23 Contractor/Agency shall ensure all assumptions; rule sets and data sources used in the QRA are clearly described and fully referenced. The Contractor/Agency shall ensure QRA report clearly document all of the steps in the QRA process including the frequency analysis and consequence analysis
- 2.9.3.24 For less complex facilities with standard design units, QRA may use standard industry data from similar operating facilities at a unit or system level. However, for complex facilities. Contractor/Agency QRA study shall be based on fully detailed parts counts and the use of on event trees. The Contractor/Agency shall identify and indicate failure modes, its effects and carry out criticality analysis for most probable and worst-case scenario events

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- 2.9.3.25 ALARP demonstration is to be carried out in case there are multiple methods available for reducing overall risk at a facility
- 2.9.3.26 The results of QRA are an estimate and only representative of the potential risks which may exist to the extent that the input data assumptions and rule sets are representative of reality. Therefore. Contractor/Agency shall ensure all assumptions, rule sets, study methodology, data sources, outcomes, recommendations, graphical representation of outcomes where required, etc used in the QRA study are clearly described and fully referenced to and are fully documented in the QRA report.
- 2.9.3.27 Contractor/Agency shall provide Intermediate results (such as leak rates for hydrocarbon systems, ignition rate or fire frequency for the facility) to assist in bench-marking facilities against each other, against other sources of historical accident data.
- 2.9.3.28 All assumptions made during the study shall be clearly documented.
- 2.9.3.29 Contractor/Agency shall obtain prior approval of IGL in case he needs any timeline extension in any assignment communicated to him by IGL. IGL shall be the final authority to grant timeline extension if justified.

- 2.10 **Qualification Criteria for team involved in carrying out Risk Assessment ( HAZOP, QRA):**
- 2.10.1 Contractor/Agency shall deploy adequate manpower, with relevant educational qualifications & professional experience in similar field to perform their duties as per the requirement of contract to carry out entire work effectively in scheduled time, within the scope.
- 2.10.2 All persons engaged by the Contractor/Agency shall be the Contractor/Agency's own employee and they will claim no privileges from IGL. The Contractor/Agency will directly be responsible for the administration of his employee as regard to general discipline and courteous behaviors.
- 2.10.3 Credentials of each team member having his CVs citing relevant experience in the desired field needs to be submitted by the bidder to Indraprastha Gas Limited along with the technical bid as a prerequisite for the qualification of the award of the job.
- 2.10.4 If deemed necessary IGL may take interview for screening of manpower/personnel proposed by Contractor/Agency.
- 2.10.5 All persons should have in depth knowledge of various national and international standards including but not limited to those as mentioned in the Sr.No. 2.1 of this document.
- 2.10.6 All the team members Contractor/Agency should be medically and physically fit to visit all the sites for carrying out the job.
- 2.10.7 IGL shall have right to reject the proposed manpower/personnel without any prejudice and without providing any clarification to Contractor/Agency.
- 2.10.8 The Contractor/Agency shall be solely and exclusively responsible for employing person in execution of this CONTRACT. The IGL shall have no liability whatsoever concerning the Contractor Service Provider's employees in any respect.
- 2.10.9 Before starting of WORK, Contractor/Service Provider shall familiarize for the Work by having obtained approval/clearance from IGL.
- 2.10.10 The team details for the particular type of safety study shall be as per the details given in below table:

Sr.No.	Type of Study	Role	Qualification Criteria
1	HAZOP	CHAIRMAN	1. Shall be a Chemical Engineering Graduate

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			<p>2. Shall have minimum 20 years of experience in Oil &amp; Gas Installation, Petrochemical plants, gas processing units, city gas distribution involving CNG and PNG facilities, Cross Country pipelines, Fertilizer Sector.</p> <p>3. Shall have experience of having carried out minimum 100 HAZOP in last 5 years in any of the above mentioned sector.</p>
		SCRIBE	<p>1. Shall have minimum 5 years of experience in Oil &amp; Gas Installation, Petrochemical plants, gas processing units, city gas distribution involving CNG and PNG facilities, Cross Country pipelines, Fertilizer Sector.</p> <p>3. Shall have experience of having carried out minimum 20 HAZOP jobs in last 5 years in any of the above mentioned sector.</p>
2	QRA	Team Leader	<p>1. Shall be a chemical/mechanical Engineering Graduate</p> <p>2. Shall have minimum 20 years of experience in Oil &amp; Gas Installation, Petrochemical plants, gas processing units, city gas distribution involving CNG and PNG facilities, Cross Country pipelines, Fertilizer Sector.</p> <p>3. Shall have experience of having carried out minimum 50 QRA jobs in last 5 years in any of the above mentioned sector.</p>
		Team Member (Software operator, data collector etc.)	Shall have minimum 5 years of experience in operation of software ,data collection and interpretation in Oil & Gas Installation, Petrochemical plants, gas processing units, city gas distribution involving CNG and PNG facilities, Cross Country pipelines, Fertilizer Sector

**2.11 Methodology , Deliverable , submission of reports of Risk Assessment ( HAZOP, QRA):**  
 There shall be Kick-off meeting of contractor /agency with key personnel of Indraprastha Gas Limited detailing the methodology for carrying out the below stated Risk Assessment Jobs. Contractor agency must submit the comprehensive plan for carrying out the Risk Assessment job keeping the below timelines and deliverables in mind:

A] HAZARD AND OPERABILITY ANALYSIS (HAZOP)			
Sr.No	Particular	Timeline	Remarks
1	Intimation	As decided by the C&P department of IGL after due diligence.	Intimation shall be given by IGL through email.
2	Site Visit & Data Collection	Contractor/Agency after taking approval from IGL shall carry out site visit and collect data and documents within 5 working days from the intimation date or as instructed by IGL.	Contractor/Agency shall adhere to IGL's Safety requirements including work permit system for carrying out any site.

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3	HAZOP Session	After collection of data the HAZOP sessions shall begin on mutually agreed data and time, however IGL will be the final authority to decide the schedule for such HAZOP sessions.	HAZOP sessions through In person meeting at IGL's decided venue/place. IGL shall have the right to decide the HAZOP session place which shall be located at any IGL operational geographical area.
4	Draft Report	Contractor /Service provider shall submit the first Draft Report within 5 working days from the HAZOP sessions.	Draft report of each HAZOP study to be submitted in hard copy or as communicated by IGL time to time.
5	Review and Comments	IGL will provide the comments/inputs if any on the Draft report submitted by Contractor/Agency within 5 working days from the receipt of first draft report.	Contractor/Agency need to coordinate with IGL for timely review and seeking comments
6	Revised Draft Report	Contractor /Service provider shall submit the revised Draft Report within 3 working days from the date of receipt of comments from IGL.	Draft report of each HAZOP study to be submitted in hard copy or as communicated by IGL time to time.
7	Final Report	After Seeking approval of IGL Contractor /Service provider shall submit the revised Final Report within 3 working days from the from date of approval of final report.	As instructed by IGL time to time Submit : a) One Final copy of each HAZOP study through email in format adobe PDF, MS WORD, etc. b) One Final colour hard Copy (well bind) of each HAZOP study.
8	Presentation of Final report	If required by Management of Indraprastha Gas Limited, contractor/agency shall present the Final Report, out comes to IGL team at any convenient date, time and place as suggested by IGL from the receipt of the final report.  Besides, if required by Management of Indraprastha Gas Limited, the contractor/agency shall be ready to Statutory and Regulatory Authorities like PESO, PNGRB, and Factory Inspector etc. During as well as upto a period of 5 years from the expiry of the work /purchase order.	IGL shall have the right to decide the presentation place which shall be located at any IGL operational geographical area or at the office of PNGRB/PESO/Factory inspector etc.  For presentation at authority office (PNGRB/PESO/Factory inspector etc.) any travelling expense from nearest office of the consultant (01 No.) to the authority office will be borne by Indraprastha Gas Limited. Mode of transportation will be at the discretion of IGL.
Note:	In case of any dispute/doubt regarding aforementioned methodology, deliverable, submission of reports of safety study (HAZOP) the decision of IGL shall be deemed final.		

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<b>B] QUNATITATIVE RISK ASSESSMENT (QRA)</b>			
<b>Sr.No</b>	<b>Particular</b>	<b>Timeline</b>	<b>Remarks</b>
1	Intimation	As decided by the C&P department of IGL after due diligence.	Intimation shall be given by IGL through email.
2	Site Visit & Data Collection	Contractor/Agency after taking approval from IGL shall carry out site visit and collect data and documents within 5 working days from the intimation date or as instructed by IGL.	Contractor/Agency shall adhere to IGL's Safety requirements including work permit system for carrying out any site.
4	Draft Report	Contractor /Service provider shall submit the first Draft Report within 15 working days from the date of Site Visit & Data Collection for that particular site.	Draft report of each QRA study to be submitted in hard copy or as communicated by IGL time to time
5	Review and Comments	IGL will provide the comments/inputs if any on the Draft report submitted by Contractor/Agency within 5 working days from the receipt of first draft report.	Contractor/Agency need to coordinate with IGL for timely review and seeking comments
6	Revised Draft Report	Contractor /Service provider shall submit the revised Draft Report within 3 working days from the date of receipt of comments from IGL.	Draft report of each QRA study to be submitted in hard copy or as communicated by IGL time to time
7	Final Report	After Seeking approval of IGL Contractor /Service provider shall submit the revised Final Report within 3 working days from the from date of approval of final report.	As instructed by IGL time to time Submit : a) One Final copy of each QRA study through email in format adobe PDF, MS WORD, etc. b) One Final colour hard Copy (well hard binding copy) of each QRA study
8	Presentation of Final report	If required by Management of Indraprastha Gas Limited, contractor/agency shall present the Final Report, out comes to IGL team at any convenient date, time and place as suggested by IGL from the receipt of the final report.  Besides, if required by Management of Indraprastha Gas Limited, the contractor/agency shall be ready to Statutory and Regulatory Authorities like PESO, PNGRB, and Factory	IGL shall have the right to decide the presentation place which shall be located at any IGL operational geographical area or at the office of PNGRB/PESO/Factory inspector etc.  For presentation at authority office (PNGRB/PESO/Factory inspector etc.) any travelling expense from nearest office of the consultant (01 No.) to the authority office will be borne by Indraprastha Gas Limited. Mode of

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	Inspector etc. During as well as upto a period of 5 years from the expiry of the work /purchase order.	transportation will be at the discretion of IGL.
Note:	In case of any dispute/doubt regarding aforementioned methodology, deliverable, submission of reports of safety study (QRA) the decision of IGL shall be deemed final.	

**RATE VALIDITY:**

- Contract shall be awarded for the duration of 2 years. Hence; rates quoted by bidder shall be valid for the duration of 2 years from the date of award of 1st contract.
  - IGL reserves the right to award the contract for 2 years duration at a time or year wise award of contract.
- 3.0 COMPLETION PERIOD:** - The maximum time frame for completion of Safety study (HAZOP/QRA) would be on case to case basis. However, the total completion period for the Risk Assessment jobs will be two years from the date of award of the contract /work/purchase order.
- 4.0 SCHEDULE OF RISK ASSESSMENT (HAZOP, QRA):** After receipt and acceptance of work order, contractor shall within seven days, forward schedule for carrying out Risk Assessment job covering all required installations/facilities region wise/geographical area wise subsequent to details as provided by Engineer in charge, for execution on as and when required basis.
- 5.0 ENGINEER INCHARGE (EIC):** Engineer in charge for the Risk Assessment on behalf of Indraprastha Gas Limited will be HoD (F&S).
- 6.0 PAYMENT TERMS:** No advance payment shall be made to the contractor/agency and 100% Payment shall be released within 45 days from the date of receipt of certified bill / certified invoice by IGL post completion of actual number of delivered services i.e. actual /exact number of Risk Assessment Jobs completed.
- 7.0 QUANTITY:** Quantities mentioned in the tender are only estimated quantities. Payment shall be done based on actual delivered services i.e. actual /exact number of Risk Assessment Jobs completed. Further, in case the quantity of Risk Assessment Job of HAZOP/QRA (quantity) remains pending in a particular Geographical Area, so in lieu of that, the identified party shall be asked to perform Risk assessment job at some other site either of similar nature /site of different nature in other Geographical Area(s) of IGL (including NCT of Delhi and NCR i.e. Gautam Buddha Nagar, Ghaziabad region(s) as well) as decided by the EIC IGL in order to compensate, thereby covering/matching the number of sites in totality.
- 8.0 PENALTY CLAUSE:** Time is the essence of the CONTRACT. Hence, execution of work i.e. HAZOP and Quantitative Risk Assessment shall be strictly done as per tender terms. Service level agreement for submission of HAZOP and Quantitative Risk Assessment report must be followed as per sr.no. **2.11 Methodology, Deliverable, submission of reports of Risk Assessment (HAZOP, QRA).** In case of non-compliance in service level agreement, on account of delay IGL (owner) will deduct penalty of INR 200/- per day (Rs. Two Hundred per day of delay) basis of delay period from contractor's bill subject to discretion of Engineer In charge of IGL. Besides, other price reduction schedule condition(s) of the tender shall also prevail. However, no penalty shall be applicable in case of:
- a) Force majeure,
  - b) When IGL has instructed not to carry out the work, for which only written evidence shall be considered /granted.
  - c) Reasons attributed to IGL.

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